

WHAT IS CLAIMED IS:

1. A *Treponema pallidum* fused antigen in which at least two surface antigens of *Treponema pallidum* are fused.
2. A *Treponema pallidum* fused antigen in which at least three surface antigens of *Treponema pallidum* are fused.
3. A *Treponema pallidum* fused antigen in which two to three surface antigens of *Treponema pallidum* are fused.
4. The *Treponema pallidum* fused antigen as claimed in Claim 1, wherein said at least two surface antigens of *Treponema pallidum* have a molecular weight selected from 47kDa, 17kDa and 15kDa.
5. The *Treponema pallidum* fused antigen as claimed in Claim 2, wherein said at least three surface antigens of *Treponema pallidum* have a molecular weight selected from 47kDa, 17kDa and 15kDa.
6. The *Treponema pallidum* fused antigen as claimed in Claim 3, wherein said two to three surface antigens of

*Treponema pallidum* have a molecular weight selected from 47kDa, 17kDa and 15kDa.



of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

8. The *Treponema pallidum* fused antigen as claimed in Claim 5, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of

17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in



with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

9. The *Treponema pallidum* fused antigen as claimed in Claim 6, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-



of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface

antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

10. An assay for anti-Treponema pallidum antibodies, comprising reacting a Treponema pallidum fused antigen in which at least two surface antigens of Treponema pallidum are fused with a sample in which said antibodies are to be detected.

11. An assay for anti-Treponema pallidum antibodies, comprising reacting a Treponema pallidum fused antigen in which at least three surface antigens of Treponema pallidum are fused with a sample in which said antibodies are to be detected.

12. An assay for anti-Treponema pallidum antibodies, comprising reacting a Treponema pallidum fused antigen in which two to three surface antigens of Treponema pallidum are fused with a sample in which said antibodies are to be detected.

13. The assay for anti-Treponema pallidum antibodies as claimed in Claim 10, wherein said at least two surface antigens of Treponema pallidum have a

molecular weight selected from 47kDa, 17kDa and 15kDa.

14. The assay for anti-Treponema pallidum antibodies as claimed in Claim 11, wherein said at least three surface antigens of Treponema pallidum have a molecular weight selected from 47kDa, 17kDa and 15kDa.

15. The assay for anti-Treponema pallidum antibodies as claimed in Claim 12, wherein said two to three surface antigens of Treponema pallidum have a molecular weight selected from 47kDa, 17kDa and 15kDa.

16. The assay for anti-Treponema pallidum antibodies as claimed in Claim 13, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of

15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus

thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of

15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

17. The assay for anti-Treponema pallidum antibodies as claimed in Claim 14, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in

view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a

C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

18. The assay for anti-Treponema pallidum antibodies as claimed in Claim 15, wherein said surface





thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.